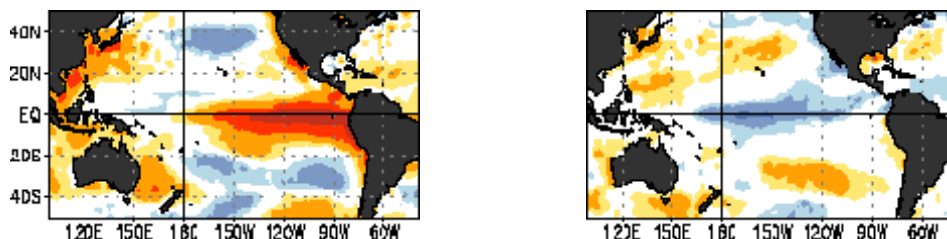


El Niño or *La Niña* ?

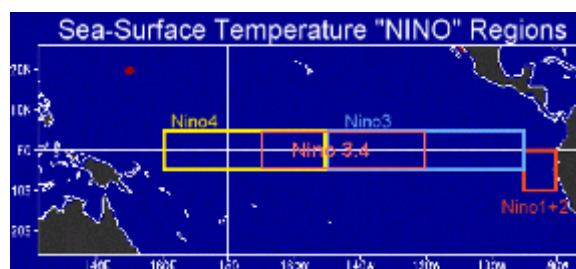
*Gregory E. Jackson, Science & Operations Officer
National Weather Service Office, San Angelo, Texas*

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The term El Niño refers to the anomalous warming of the central and eastern equatorial Pacific Ocean waters and the associated weather changes that accompany this warming. La Niña is the anomalous cooling of these waters along with the accompanying weather changes. Both of these events tend to reach maximum intensity during the cool season followed by the abatement of these phenomena during the summer. In west central Texas, El Niño tends to bring cooler, wetter conditions, and La Niña brings warmer, drier conditions to the area. The El Niño/La Niña cycle is often referred to as the El Niño Southern Oscillation (ENSO). The ENSO cycle is very irregular but lasts approximately three to five years. The graphics below depict typical sea surface temperature anomalies during an El Niño event (left) and La Niña event (right). Anomalously warm temperatures are depicted as orange and red while anomalously cool temperatures are depicted in shades of blue.



El Niño and La Niña may be diagnosed a number of ways. Some popular measurements include equatorial trade wind anomalies, Tahiti-Darwin sea-level pressure difference anomalies (otherwise known as the Southern Oscillation Index), and sea surface temperature anomalies. Which ever index is used, it is somewhat subjective at which point the anomaly is large enough to diagnose an El Niño or La Niña event (as opposed to normal or neutral conditions). Studies performed at the National Weather Service in San Angelo correlating the ENSO cycle to rainfall in west central Texas suggest that precipitation trends in this area are most closely linked sea surface temperature anomalies in Niño region 3.4. The graphic below depicts the Niño regions where sea surface temperatures are tracked.



The table below ranks years by Niño 3.4 sea surface temperature anomaly. The anomalies shown are averaged from July of the listed year to June of the next year, since this is generally the period during which an El Niño or La Niña event exists. This approach is taken since a given year can start with El Niño conditions in the winter changing to La Niña by fall (or vice-versa) making it difficult to classify any given year (January through December) as strictly one or the other. The third column in this table indicates the amount of rainfall that occurred during this period at San Angelo. In this table, El Niño years are depicted in red, neutral years in black, and La Niña in blue, and anomalies of $\pm 0.5^{\circ}\text{C}$ are chosen as the dividing point between El Niño/La Niña and neutral conditions.

<i>Year</i>	<i>SST Anom. °C</i>	<i>Precip. (In)</i>	<i>Year</i>	<i>SST Anom. °C</i>	<i>Precip. (In)</i>
1997	1.92	13.13	1989	0.08	19.38
1982	1.92	12.91	1978	0.07	16.10
1991	1.37	29.46	1980	0.01	34.21
1965	1.22	13.65	1959	-0.05	31.55
1986	1.16	43.52	1966	-0.07	14.83
1957	1.16	17.80	1956	-0.08	19.16
1972	1.13	23.40	1962	-0.14	14.91
1968	0.79	19.26	1971	-0.14	27.04
1987	0.78	17.11	1961	-0.22	12.18
1994	0.70	24.59	1985	-0.25	22.46
1976	0.62	25.02	1967	-0.30	29.33
1969	0.61	26.48	1964	-0.30	15.63
1963	0.49	10.89	1983	-0.35	13.53
1990	0.48	25.29	1950	-0.43	14.65
1951	0.47	N/A	1995	-0.45	15.43
1992	0.47	15.36	1974	-0.49	30.22
1979	0.47	17.89	1984	-0.65	23.65
1977	0.38	10.94	1954	-0.76	9.15
1958	0.35	16.84	1955	-0.89	7.94
1993	0.34	14.70	1975	-0.94	17.75
1953	0.31	20.40	1999†	-0.98	2.48
1952	0.26	13.44	1970	-0.99	13.20
1981	0.25	29.33	1998	-1.04	18.31
1996	0.14	31.02	1973	-1.11	12.76
1960	0.09	21.66	1988	-1.32	16.70

† July-December average & total so far

Normal Annual	20.45"
El Niño Average	22.19"
Neutral Average	19.90"
La Niña Average	14.93"

While it is somewhat evident that El Niño tends toward wetter conditions and La Niña toward drier, it is also clear that there are exceptions to this rule, some quite significant.